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NEW SPECIES AND ONE NEW GENUS OF GEOMETRIDÆ.

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(With Plate VI.)

In the early part of the present year the writer was engaged in the rearrangement of Dr. Wm. Barnes' collection of North American Geometridæ which is stationed at his home in Decatur, Illinois. This collection is undoubtedly the largest of its kind in the United States, not excepting that in the National Museum, which, however, is richer in types. Among the material studied were many new species, a few of which are described in the present paper. The remainder of the material will be worked up as opportunity serves, though perhaps only in connection with the groups to which the species respectively belong.

1. *Mesoleuca interrupta*, new species.

Expanse, 20-21.5 mm. Palpi, head and thorax pale yellowish, the central portion of the front, vertex at base of antennæ and thorax at insertion of primaries dark brown. Antennæ beneath, brown or yellowish, above marked alternately with brown and white. Abdomen above, whitish, dusky on central segments, with brown central spots which tend to disintegrate laterally, last segment brown with central white stripe, anal brush yellowish; beneath, entirely yellowish. Primaries white, more or less profusely dusted over with dusky scales. Basal line about one-fifth out, white, rather narrow, sharply angulated on cubital and anal veins. Intradiscal line crosses less than one-half out, white, quite broad, somewhat irregular in its course but on the whole curved

outwardly. Costal region of the areas on either side of the basal line dark brown. Extradiscal line white, somewhat lost in the dusky scales just outward of this line, begins on costa one-third in from apex, curves inward to M_1 , then to Cu_2 is produced outwardly in two scallops and then runs irregularly inward to inner margin, sending a spur to the intradiscal line in the submedian space. The area between the intra- and extradiscal lines is filled in with light and dark brown, the darker color occupying the costal and inner marginal regions and a portion of the inner central space between M_1 and Cu_2 ; the lighter color occupying the remainder. Submarginal space with a costal blotch formed of the dusky scales, which latter also occasionally form one or two brokenly scalloped lines following in general the extradiscal line. A large subapical patch on outer margin sending two or three rounded teeth inwardly. Terminal line fine, incomplete, showing only on lower portion of wing where it is not absorbed by the apical patch. Fringes checkered. Secondaries rather uniformly pale smoky, with a faint reddish tinge. A moderate, dusky, discal spot. An indication of a median stripe on inner margin. Terminal line brown, sending small squarish spurs into the inner half of the fringe. Beneath, evenly smoky on primaries in central and inner areas, remainder yellow with brown strigations. The central fascia and subapical patch are reflected, but not strongly. Secondaries whitish-yellow, finely strigate with brown. A brown irregular cross-line best marked on costa extends two-thirds across the wing outward of the middle. Occasionally this reappears on the inner margin near the anal angle as a diffuse spot. A second, large conspicuous spot is on the center of the inner margin and tends rarely to unite with the discal spot.

Types.—Four males and three females, all in Dr. Barnes collection except two cotypes, which are with the author.

Habitat.—Redington and Santa Catalina Mts., Arizona. I have before me also several other poor specimens which have not been made cotypes.

The species is not a typical *Mesoleuca*, but is referred here in the absence of a more suitable genus. In structure it differs only in the long palpi, which are slender and project far beyond the head. In general appearances it differs considerably from the more typical members of the genus.

2. *Mesoleuca interrupta ochreatea*, new variety.

This form, which at first glance appears very closely to resemble the species to which I refer it as a variety, is seen on close observation to differ from it in many points, which however I am inclined to regard as only varietal. Aside from the bright yellow ground color of the primaries, which contrasts strongly with the pure white of typical *interrupta*, the median fascia is unbroken and less attenuated posteriorly; the basal and intradiscal lines are narrower and extend further out on the cubital vein making, in the case of

the latter, a deep indentation in the inner edge of the median fascia; and the subapical patch is larger and prolonged into the wing. All in all, there are so many points of difference toward which the eleven examples of typical *interrupta* do not tend that I think a varietal name is warranted.

Type.—One female in Dr. Barnes' collection.

Habitat.—Palmerlee, Cochise Co., Arizona.

3. *Hydriomena viridescens*, new species.

Expanse, 23-26 mm. Head pale bluish-green, palpi largely dark brown, antennæ whitish, fringed with brown. Thorax greenish, with four brown spots arranged in a square on the dorsum, and one at the inception of each fore wing. Abdomen gray with narrow white bands at the apex of the individual segments dorsally which extend anteriorly in the middle and divide into two parts a brown blotch which just precedes it. Primaries evenly pale bluish-green (which color becomes almost white or yellowish on exposure to light), crossed by ten or eleven denticulate or scalloped narrow black lines. The first, close to the base of the wing, is frequently a mere dot, or may be absent entirely. The second and fourth are curved outwardly and are usually well-defined, and between these runs the third which is diffuse, comparatively broad, and occasionally incomplete or absent. From the outer of this series of lines to the sixth the ground color is whiter. The sixth line is strongly marked, sharply denticulate and, as a whole, less curved outwardly than any of the others. Line five is narrower but in general the same. The seventh line, very narrow and only faintly denticulate, may run through the elliptical discal spot or directly outside it. Between lines eight and ten which are well scalloped the ground is whiter again and divided into two by a fine line (number nine). The eleventh line is rather broad, diffuse and frequently broken, especially in the central portion of the wing. A black blotch between veins R_5 and M_3 represents the remnant of the twelfth line. Terminal line indicated by a black spot on either side of each vein. Fringe checkered black and faintly pinkish, more or less markedly. Secondaries salmon colored, paler inwardly. Terminal line as in primaries but fainter and more diffuse. Beneath, primaries salmon colored outwardly, the markings of above feebly reflected, and sometimes with a large, diffuse subapical shade. Secondaries as above but with small, dark discal spot.

Types.—Five males and seven females in the collection of Dr. Barnes and the author.

Habitat.—Provo, Utah, August 4-14; Santa Catalina Mts., Sept., Huachuca Mts., Baboquivaria Mts., Pima Co., July 15-30 (Poling), and Redington, Arizona.

This neat little species, of which I have seen other specimens from the same general region, is most nearly related to "*Canocalpe*" *magnoliata* Gn. and differs principally in its smaller size, narrower

and more defined cross-lines and the salmon-colored hind wings. It soon loses the greater part of the delicate green tint of the fore wings when placed in the light or in a relaxing box for even a short time.

I place this species provisionally in *Hydriomena*, where so many odd species belonging to the *Cidaria* group are mingled. Its immediate ally, *magnoliata*, has recently been rejected from the genus *Canoicalpe* by Pearsall (Can. Ent., XLI, 366) to which, with *aurata* and *oxygramma*, it was long known to be a dissonant associate; but he has not provided another genus for its reception.

4. *Stamnodes albiapicata*, new species.

Expanse, 26-28 mm. Head and palpi brown with some light colored scales intermixed; thorax brown; abdomen yellowish, first segment and part of the apical segments brownish. Wings above pale smoky, the costal area dark brown interrupted with four white patches; the first square, rather small, situated one-fifth out from base; the second over one-third out, similar in shape to the first but larger, and tending to widen posteriorly; the third rectangular and occupying the space from the center of the wing to a point almost two-thirds out on costa; the fourth narrow, beginning less than one-third in from the apex and extending obliquely inward to vein M_1 . Apex slightly paler than the rest of the wing and with a faint reddish tinge. Fringes white, marked with brown at ends of veins. Beneath, primaries as above but with the brown extending further in toward middle and somewhat broken up by whitish mottlings, more or less profuse. The white costal markings are obscured or entirely lost as a result of this mottling except the oblique line which stands out contrastingly. The apex to R_3 is white, more or less sprinkled over with brown scales. Secondaries mottled with light and dark brown over a whitish background, the dark brown interruptedly marking some of the veins and tending to form three large patches, one within the discal cell, one nearer the outer margin between M_1 and M_3 , and another on the inner margin near the anal angle. Just preceding these two latter spots are indications of a curved whitish cross line, best marked on the costa and inner margin. Apical area sometimes pure white. Discal spot elliptical, white, conspicuous.

Types.—Two males in Dr. Barnes' collection and in that of the author.

Habitat.—Redington, Arizona.

Allied to *Stamnodes gibbicostata* Walk., but smaller, more frail and narrower winged.

5. *Annemoria pectinaria*, new species.

Expanse, 26 mm. Palpi and front pink, vertex green; thorax green;

abdomen whitish-green, without markings. Primaries pea-green with numerous fine, whitish transverse mottlings, costa narrowly white on outer three-fourths, fringe edged with white. Two narrow, white lines cross the wings. The first beginning on the radial vein, inward of the middle, extends outwardly curved and slightly irregular to inner margin ending less than one-fourth out from the base of the wing. The second begins on the costa one-fifth in from the apex and extends slightly outwardly curved and with scarcely perceptible teeth on the veins in the lower part of the wing to a point just outward of the middle on the inner margin. Secondaries pale green becoming darker green toward inner margin. An outwardly curved white line on inner fourth. A denticulate white line midway between the first line and the outer margin. This line to Cu_2 runs much like the first but less strongly curved, then turns outward to inner margin. Both the lines are twice as broad as those on the primaries. Beneath, rather even pale green, darkest on costal and apical areas of primaries, the outer line of both wings reflected.

Type.—One female in Dr. Barnes' collection.

Habitat.—Redington, Arizona.

Allied to *Annemoria bistrifaria* Pack., from which it differs by the much narrower lines on the primaries, the presence of an inner line on the secondaries and by the outer line on these latter wings being strongly denticulate.

The antennæ of the present species differ from those of the female of *bistrifaria* in being shortly pectinated at the basal two-thirds instead of dentate.

6. *Synchlora lesteraria*, new species.

Expanse, 19–23 mm. Front green, vertex white; thorax green, whitish centrally and with a white collar; abdomen whitish with pale brown dorsal tufts on four or five of the anterior segments. Wings even pale apple-green. Primaries with an outwardly oblique broken white line crossing the wing about one-fourth out from base; this is vague or indicated by a spot near costa, but becomes broader and more continuous toward inner margin and tends to broaden still more at the anal vein. Inwardly of this line, below cubitus, is a small, irregular, cream colored patch with a few brown scales upon it, and below the anal vein is a much larger similar spot which fills the space from the line half way to the base of the wing. An outer white line on about outer fourth of wing shows as an outwardly curved, narrow crescent between M_1 and M_3 , followed by a rather large cream colored spot with brown scales, and from Cu_1 to inner margin as an inwardly curved line, somewhat toothed on the veins and in the interspaces. In the anal angle to this line is a large cream colored spot with scattered brown scales which collect, more densely near the outer edge of the patch, into a short zigzag line. Discal spot absent. Fringe white. Secondaries with basal portion of wing wholly white, the outer margin oblique and nearly continuous with inner line

of primaries. Outer line fine, sinuous, following in general the outer margin but extending well in toward the center of the costal and inner margins. There are spots outward to this line as on primaries and similarly disposed, except that the one in the anal angle is further removed along the inner margin. In addition there is also a diffuse white patch outward of the line on the costa. Beneath, both wings even pale green, all the markings of the upper side reflected in white.

Type.—Two males from Dr. Barnes.

Habitat.—South Arizona, May 1-15 and Santa Catalina Mts., Pinal Co., Arizona.

This species is in appearance much like *Racheospila niveociliaria* H. S. (= *saltusaria* Hulst).

7. *Aplodes splendidaria*, new species.

Expanse, 31 mm. Palpi and front pink, vertex white anteriorly, green posteriorly; thorax and abdomen green, the latter apparently without dorsal spots, though being partly discolored by grease this cannot be said with certainty. Primaries apple-green, costa rather broadly edged with deep flesh-color, outer edge deep red, narrowly interrupted at the veins with whitish, inner half of fringe white, outer half pink. Two rather broad and well defined white lines cross the wing. The first begins outward of the middle on vein M_1 and runs with an outward curve inwardly obliquely to inner margin, thence following the inner margin to base of wing. The second begins on R_5 between the origin of the first line and the apex of the wing and extends in an almost straight line to inner margin ending less than one-third in from the anal angle. No discal dot. Secondaries lighter green than primaries, the costal area and the veins whitish. Outer edge and fringe as in primaries. Two whitish lines cross the wing; the first on inner third outwardly angled in the cell and again between the cubital and anal veins; the second on outer third, strongly curved outwardly to below Cu_1 then bent inward to inner margin. Beneath smooth green, the inner area of primaries whitish, flesh-colored costa, red outer margins repeated, the cross lines also showing but more feebly.

Type.—One male in Dr. Barnes' collection.

Habitat.—Palmerlee, Arizona.

This species with its bright green color, contrasting white markings and dark red borders is the most beautiful of the genus. It is most nearly allied to *obliqua* Hulst, but the inner line is inwardly instead of outwardly oblique as in Hulst's species.

✓ 8. *Aplodes strigataria*, new species.

Expanse, ♂ 28 mm., ♀ 32-35 mm. Palpi white, upper surface with scattered red scales, terminal joint entirely red; front red; vertex white. Thorax and abdomen uniformly pale green, or, the latter with the segments edged

posteriorly with white. Wings pea-green, profusely strigated with irregular, transverse, whitish markings; costa of primaries narrowly edged with white; fringe whitish, occasionally with a narrow pink line at inner edge, and marked with pink at the ends of the veins. There are traces of an outwardly curved, white, inner line at inner third of both wings. A rather narrow outer line crossing both wings is more defined, yet sometimes lost in the transverse markings. On the primaries it is situated slightly inward of the outer third, runs parallel to the outer margin and is somewhat scalloped. On the secondaries it crosses outward of the middle, is decidedly scalloped and follows in general the course of the outer margin, being somewhat bent outward below the median vein. Discal dots vague but present on all wings. Beneath, uniformly green, paler than above, with faint reflections of the outer line of upper side. Fringe as above.

Types.—Two males and four females from Dr. Barnes (two of the cotypes in my own collection) and one female from Mr. Frank Haimbach and in his collection.

Habitat.—Huachuca Mts., Arizona, July; Redington, Arizona; South Arizona, July 15-30.

Distinguished from its congeners by its large size and profusely strigated wings. *Aplodes darwiniata* rivals it in size, but in this species the strigations are fine and exceedingly faint in comparison.

9. *Cymatophora trilinearia*, new species.

Expanse, 27-29 mm. Head whitish-gray, the front sometimes margined with yellow. Palpi and antennæ pale yellow. Thorax and abdomen whitish-gray, the former with a narrow yellow collar, the latter tinged with yellow which becomes more intense apically. Primaries whitish-gray, more or less scattered over with brown atoms; costa narrowly edged with yellow. Three usually well defined pale brown lines of moderate breadth cross the wings. Rarely these are represented by pale yellow spaces, or are somewhat obscured by the profusion of brown atoms. The first crossing slightly outward of the inner fourth extends outward from costa, turns downward within the cell and thence runs almost straight to inner margin, being slightly curved inwardly between the cubital and anal veins. The median line, sometimes reduced to a mere shade, originates in a yellow costal spot, is either straight or curved outwardly above Cu and inwardly curved below this vein, and precedes or passes through the small round or elongated discal spot when this is present. The outer line, also originating in a yellow costal spot, crosses the wing about one-third in from the outer margin, extends outward from costa to M_1 , then inward to inner margin curving evenly outward before reaching that edge. One-sixth in from the apex, on the costa, is a triangular yellow spot edged with brown, and occasionally a second yellow patch is present in the outer area between M_3 and Cu_2 . A black terminal line showing between the veins, more particularly in the central portion. Fringe gray or brownish-gray,

divided by a fine white line which runs through the center. Secondaries pale yellow, more or less irrorate with brown atoms, especially toward inner margin. A single rather broad, diffuse line (sometimes absent) passes through the center of the wing approximately parallel to the outer margin. Terminal line brown, narrow. Discal spot absent. Fringe light gray or brownish. Beneath, both wings pale yellow, the primaries somewhat grayish on inner and basal areas. Brown irrorations are present over the secondaries and over yellow portion of primaries.

Types.—Six males and three females in Dr. Barnes' collection and in that of the author.

Habitat.—South Arizona, July 15–30, Aug. 1–15, and Gila Co., Arizona, June (Poling); Redington, Palmerlee and Huachuca Mountains (Barnes).

This is the species referred to by me in the Proceedings of the Entomological Society of Washington, Vol. X, p. 87, as *Cymatophora tenebrosata* Hulst.*

The specimens before me do not run so variable as those in the National Museum but have tendencies in similar directions.

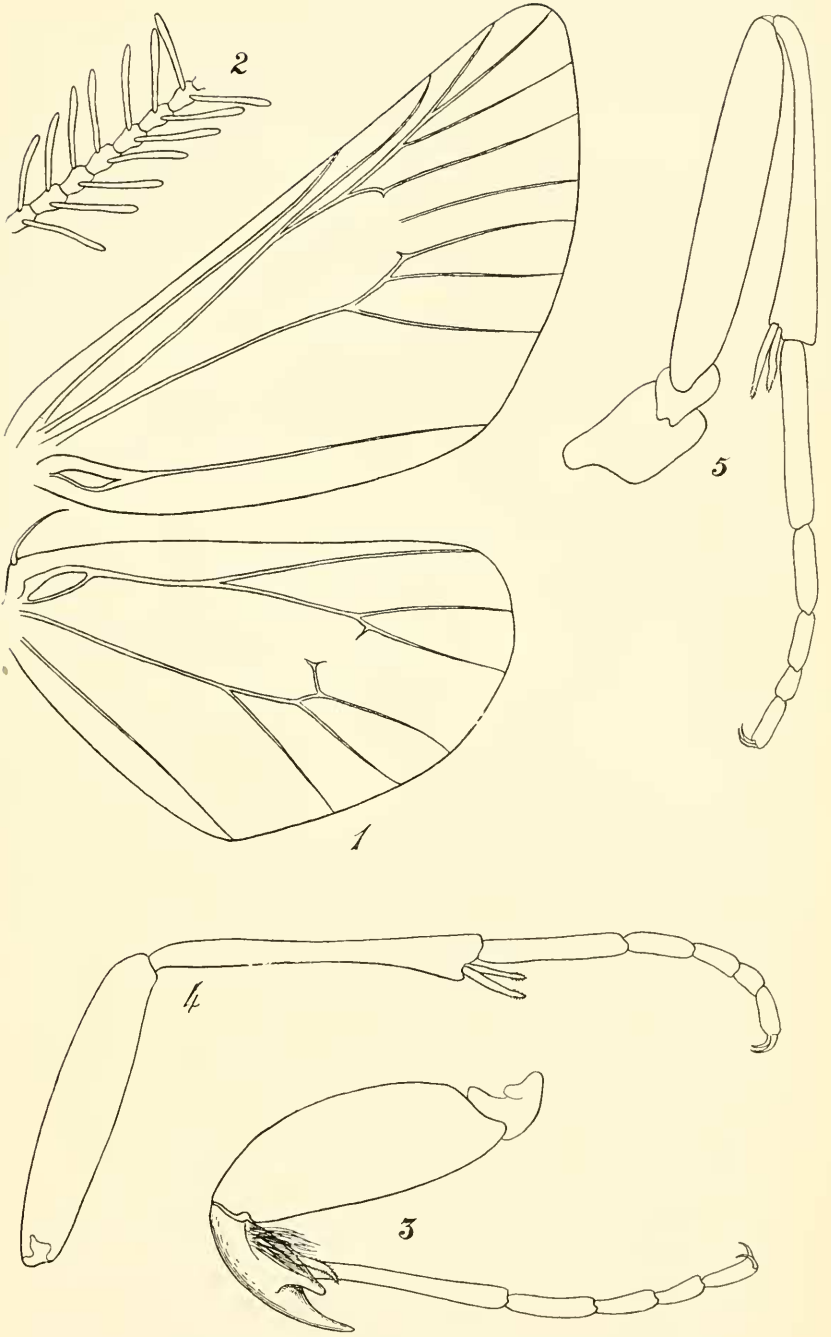
The species is allied to *Cymatophora inquinaria* Hulst, but compared with examples of that species at hand in smaller, whiter, far less strigate on the primaries (which in the present species is scarcely strigate when the atoms are profuse), and with comparatively minute discal spot when this is present at all.

Barnesia, new genus.

Front slightly longer than broad, smooth; palpi short, not extending beyond the front; antennæ bipectinate to tip in both sexes, the pectinations of the male long and somewhat clavate apically, those of the female short; tongue absent. Thorax and abdomen robust, the former tufted posteriorly, the latter smooth. Tibia of anterior legs short, swollen, with two large, apical corneous processes of unequal length which take the form of spurs; epiphysis originating near base of joint and extending beyond the shorter of the apical processes. Middle and posterior tibiæ with a single pair of spurs, the posterior tibia without a hair pencil. Fore wings moderately broad, costal margin very slightly concave, outer margin evenly rounded or with a trace of an angle at the center, veins R_2 , R_{3+4} and R_5 on one stalk, no accessory cell; hind wing with outer margin evenly rounded or faintly angled at center, and angle slightly pronounced, vein Sc anastomosing with R for half the length of discal cell, M_2 absent.

Type.—*Barnesia ritaria* Gross.

* See Ent. News, Vol. XX, p. 353.



Structural characters of the genus *Barnesia* Grossb.